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EXCHANGE DESIGN PATTERNS FOR ELECTRONIC INTER-MEDIARIES

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Abstract

Intermediaries have introduced electronic services with varying success. One of the problems an intermediary faces is deciding what kind of exchange service it should offer to its customers and suppliers. For example, should it only provide a catalogue or should it also enable customers to order products? Developing the right exchange design is a complex undertaking because of the many design options on the one hand and the interests of multiple actors to be considered on the other. This is far more difficult than simple prescriptions like 'creating a win-win situation' suggest. We address this problem by developing design patterns for the exchanges between customers, intermediary, and suppliers related to role, linkage, transparency, and novelty choices. For developing these design patterns, we studied four distinct electronic intermediaries and identified exchange design choices that require trade-offs relating to the interests of customers, intermediary, and suppliers. The exchange design patterns contribute to the development of design theory for electronic intermediaries by filling a gap between basic business models and detailed business process designs.

Keywords: Electronic intermediaries, exchange, design theory, design patterns.

1 INTRODUCTION

The promises of electronic business have given rise to a boom in business-to-business initiatives by new Internet start-ups and traditional firms. The disappointing growth of electronic business in general and the lack of success of specific firms have resulted in a less optimistic and positive outlook for electronic business. The progress of business-to-business electronic commerce has been hindered by unanticipated technical, organizational, economic, and legal challenges that diminish its value (Dai & Kauffman, 2002a). Electronic intermediaries are an interesting application domain of electronic business. An intermediary brings together customers and suppliers and facilitates demand and supply activities for the exchange of goods, services, and information. Intermediaries are at the forefront of the changes by their virtue of being in the middle and operating on thin margins (El Sawy, Malhotra, Gosain, & Young, 1999). On the one hand, electronic business offers intermediaries opportunities to reinvent their value logic by offering new services or providing existing services in new ways. On the other hand, intermediaries are threatened by the opportunities that electronic business offers to customers and suppliers for doing direct business more easily.

¹ Just before the final submission of this paper, René Wagenaar suddenly passed away on the 25th of February. It is a sad loss to science, just as it is a sad loss to us and his many friends in this field as a warm and interested person.

Why are some electronic intermediaries successful and others not? There is a lively debate about intermediation, disintermediation, and reintermediation in the literature on electronic intermediaries (Chircu & Kauffman, 2000). The general conclusion is that intermediaries are still needed but that the intermediary role is changing (Anderson & Anderson, 2002). The changing role of intermediaries raises the issue of voluntary acceptance of a specific kind of intermediary. In some cases a marketplace with registration may be more acceptable for customers or suppliers while in other cases a catalogue with open access may be more acceptable. This issue is still largely unaddressed in research. Our research focuses on the exchange design of the intermediary: the way an intermediary coordinates activities and resources in the vertical business network by structuring (a part of) the exchange between customers and suppliers. Developing the right exchange design is a complex undertaking due to the many design options on the one hand and the interests of multiple actors that need to be considered on the other (see, for example, Kambil & van Heck, 2002). This is far more difficult than simple prescriptions like ‘everyone must benefit’ suggest.

Developing design theory has been identified as an important contribution in the areas of Management (van Aken, 2004) and Information Systems (Hevner, March, & Park, 2004). There is more and more design knowledge available on electronic commerce in general, like business models and networks, or on specific types of electronic intermediaries, like electronic auctions. There is less attention, however, for the electronic intermediary as such. Therefore, we developed *design patterns for intermediaries* to support the intermediary as designer. Design patterns capture the essence of general repeatable solutions to commonly-occurring problems. Design patterns have been developed for designing buildings and towns (Alexander, Ishikawa, & Silverstein, 1977) and ICT software (Gamma, Helm, Johnson, & Vlissides, 1995). For example, the role choice of the intermediary has consequences for the value creation for customers and/or suppliers on the one hand and for the implementation effort and cost for the intermediary on the other.

To conclude, the focus of our research is upon the critical exchange design choices of electronic intermediaries that require trade-offs relating to the interests of customers, suppliers, and intermediary. This design knowledge is captured in patterns. Patterns for intermediaries that draw attention to critical design choices are new, and can be helpful in understanding and improving electronic commerce solutions for intermediaries and their suppliers and customers. These patterns fill a gap between basic business models and detailed business process designs. The remainder of this paper is organized as follows: after delineating our research approach, we briefly discuss four case studies of electronic intermediaries and the main case findings. Thereafter, we show how these findings resulted in the design patterns. Finally, we related the patterns that we identified empirically to existing theories and literature, before drawing some conclusions.

2 RESEARCH APPROACH

For the research a case study approach has been selected because of the exploratory nature of the research problem and the need to identify good and bad practices. A case study enables researchers to benefit from the knowledge of practitioners (Benbasat, Goldstein, & Mead, 1987) and results in theory that is empirically valid (Eisenhardt, 1989). We studied four different electronic intermediaries by identifying their exchange design choices, the interests of the customers, intermediary, and suppliers and the acceptance (usage and satisfaction) of the electronic service.

For the exchange design choices we made use of an exchange design model constructed in an earlier phase of the research (Fielt, 2006). This model consists of four exchange design themes: (1) *role*: The position of intermediary in relation to the other actors in the business network with respect to the business activities; (2) *linkage*: The way the electronic interactions between the actors in a business network are arranged with respect to access, standardization, and coupling; (3) *transparency*: The visibility of information in the business network; the extent to which information is made available to the actors; (4) *novelty*: The newness and compatibility of the electronic service introduced by the intermediary in comparison to the traditional situation. For example, an intermediary can occupy an extensive

role (such as a wholesaler) or a limited role (such as a catalogue). The four design themes were derived by an empirical study and are supported by theory, but leave some design issues untouched, most prominently complexity, trust and technology (Fielt, 2006). Moreover, it is required that there is an opportunity for an intermediary and that trust and power do not interfere with voluntary acceptance.

We selected four cases with variety cross the exchange design themes and voluntary acceptance, in which the existence of an intermediary is plausible. This resulted in the following case studies: Tapestry (soft furnishing industry), SeaQuipment (maritime industry), Meetingpoint (insurance industry), and Voogd & Voogd (insurance industry). For example, Tapestry can be characterized as an intermediary with an extensive role and high novelty while SeaQuipment can be characterized as an intermediary with a limited role and low novelty. The data collection took place from 2003, starting with Tapestry, till 2005, for Meetingpoint and Voogd & Voogd. It occurred in two steps: firstly, at the intermediary and secondly, at actual and potential customers and suppliers. Different sources were used for data collection, for example, interviews at the intermediary and at customers and suppliers, internal and external reports and presentations, and use or demonstration of the electronic service.

As a basis for the within-case analysis, a structured case description was made of the business network. Next, the most important exchange design choices were identified based upon the exchange design model. The design choices were related to the interests of the actors and compared with acceptance, resulting in the within-case case findings. The cross-case analysis consists of a cross-case overview and the development of design patterns. The former presents the exchange design, interests and acceptance of each case alongside one another to provide a comprehensive picture for the cross-case analysis. The latter are based on trade-offs with respect to one or more themes from the exchange design model and were identified by clustering the specific findings of the within-case analysis (annex A). Therefore, the patterns have an empirical, exploratory nature. Moreover, the relations between the findings and the patterns are not univocal: other combinations are imaginable, leading to different patterns. To support the patterns, we mapped them onto design choices identified in the literature. In order to make the patterns universally applicable more evaluation is needed. This is beyond the scope of the current study.

3 CASE DESCRIPTIONS

In this section we present four cases: Tapestry (soft furnishing industry), SeaQuipment (maritime industry), Meetingpoint (insurance industry), and Voogd & Voogd (insurance industry). Tapestry was an electronic intermediary in the soft furnishing industry. Tapestry was a new initiative of Hunter Douglas starting its services in 2001. Hunter Douglas is a large firm active in the adjoining markets of window coverings and architectural products. Tapestry offered a web purchasing service for interior fabrics to professional interior designers in the United States and a sales service to European producers. Designers get a full service including an electronic catalogue, fabric samples, ordering pieces of fabrics, and logistics. Tapestry has two options for producers: the rolls of fabrics are on consignment at the Tapestry warehouse or the rolls are at the warehouse of the producer. Tapestry had to cope with limited acceptance by designers and ended its operations in 2004.

SeaQuipment (www.seaquipment.nl) is an electronic intermediary in the maritime industry. SeaQuipment is a new initiative of the VNSI, the Netherlands' Shipbuilding Industry Association. They offer a web catalogue to ship owners, shipyards, and maritime suppliers. The web catalogue has a product structure developed by SeaQuipment. Anyone can search in the catalogue of SeaQuipment. Maritime sellers have to register and enter their product information in the catalogue. SeaQuipment is reasonably well accepted in the market.

Meetingpoint and Voogd & Voogd are intermediaries in the agent channel of the Dutch insurance industry. Meetingpoint is a new initiative of a number of insurance companies. Meetingpoint (www.mp4all.nl) offers a platform for administrative transactions to insurance agents and insurance companies. Agents can access Meetingpoint via their own administrative software, via the extranet of

the insurance company, or via the portal of Meetingpoint. Insurance companies get the electronic transactions forwarded by Meetingpoint and process these transactions themselves. Meetingpoint is reasonably well accepted by agents but this is mostly via the extranets of insurance companies. Meetingpoint is not yet widely accepted by insurance companies.

Voogd & Voogd (www.voogd.com) is a family firm that was already active as intermediary in the agent channel. Voogd & Voogd offers an electronic marketplace to agents and is an authorized broker for insurance companies. Agents can compare insurances on prices and conditions and apply for a policy. Voogd & Voogd selects agents on their willingness and abilities to work electronically. Insurance companies are not involved in the administrative processing. The marketplace is very well accepted by the agents that cooperate with Voogd & Voogd and Voogd & Voogd has many brokerage agreements with insurance companies, amongst them all larger ones.

4 FROM CASES FINDINGS TO EXCHANGE DESIGN PATTERNS

The four cases vary significantly over the four dimensions of our design model. Also, they differ with respect to the effects upon the interests and the acceptance of the electronic service. The overall acceptance has been traced back to the design issues and interests, in order to draw conclusions with respect to the contribution of design choices to acceptance. We illustrate a number of case findings, related to the role and transparency themes. Analogously, other case findings have been derived from the cases, related to the other design themes. An extensive list of case findings is given in annex A.

For role, we see a contrast between Tapestry's and Voogd & Voogd's extensive roles and SeaQuipment's limited role. Voogd & Voogd in particular make us aware of the many opportunities for value creation of an extensive role, while Tapestry points towards the risks of such a role with respect to implementation effort and cost. Tapestry also points towards the possibilities of reducing implementation effort and cost for an extensive role through outsourcing their warehouses. While SeaQuipment shows that a limited role as catalogue can also be suitable, it reveals the danger of becoming too marginal. A similar dilemma is found in the Meetingpoint case (limited role, limited value added) and the customers of Meetingpoint need for additional services such as comparing prices.

For transparency, we also see very different approaches in the cases. SeaQuipment is basically a catalogue, taking care of product and producer transparency, but no price or process transparency. Buyers cannot compare pricing (in the interests of suppliers), but supplier cannot trace potential or actual buyers (apparently in the interest of buyers). The net effect, however, is that it is difficult for SeaQuipment to show its actual value to suppliers: transactions originating from SeaQuipment cannot be traced! Meetingpoint is a market place with a supplier bias. In their interests, it is not possible to compare products of different insurance companies easily. Voogd & Voogd, in its turn, gives full transparency of prices, products, producers, and process, primarily serving the interests of insurance agents. This, however, comes at a price, again: there is a negative effect for insurance companies, and it gives Voogd & Voogd the responsibility of maintaining a full product database itself, basically copying insurer back-office functionality.

To conclude, we see a tension between the different interests of actors for the design choices. Different choices have different impacts, without being able to simply state that one design option is always better than another. The exchange design patterns are based upon this trade-off with respect to one or more themes from the exchange design model and were identified by clustering the specific findings of the within case analysis, also presented in annex A. Table 1 provides an overview of the patterns. Each pattern has the following structure: the context under what conditions a pattern holds, the problem that needs to be solved, the solution that solves the problem, and the consequences of using a design pattern (based on, Alexander et al., 1977; Gamma et al., 1995). Each pattern is described according to this structure, except for the context which we leave out. The variety of evidence from the cases indicates that different solutions are possible indeed. As such, these patterns do not give a normative description ("In order to be successful, you should choose an extensive role towards the customer"),

but they point at the trade-offs between different design options, and measures to compensate negative consequences for actors in the network.

	Exchange design option	Themes	Interests trade off
P1.	Role size of intermediary: Extensive or limited	Role	Value creation potential vs. implementation effort & costs
P2.	Working cross suppliers: Much or little	Role, linkage	Customer value vs. relation supplier/customer
P3.	Supply chain structure: Centralized or distributed	Role, linkage, novelty	Supplier involvement vs. integration requirements
P4.	Supply transparency: High or low	Transparency	Customer value vs. intermediary/supplier value
P5.	Demand transparency: High or low	Transparency	Supplier value vs. intermediary/customer value
P6.	Customer service innovation: New or traditional	Role, linkage, novelty	Customer advantage vs. customer compatibility

Table 1. Overview of the exchange design patterns.

5 EXCHANGE DESIGN PATTERNS

Pattern 1: Role size of the intermediary

Problem: An intermediary can choose between an extensive role with greater opportunities to add value for customers and/or suppliers or a limited role with less implementation effort and cost for the intermediary.

Solution: If an intermediary wishes to have many possibilities to add value for customers and/or suppliers, it should opt for an extensive role. This provides the intermediary with more value activities and the intermediary can integrate activities to create value. Voogd & Voogd makes it easy for insurance agents to compare and order insurance products. An intermediary should choose a limited role if it wants to restrict its own implementation effort and cost. The introduction of SeaQuipment did not require a large amount of resources from the VNSI. However, a limited role requires additional services to be available from service providers and/or suppliers. Moreover, customers themselves have to integrate these services. The customers of Meetingpoint need a separate tool from a software firm to compare insurance products. An intermediary may go beyond this trade-off by occupying an extensive role while limiting the effort and cost by outsourcing. The fabrics' warehouses are the responsibility of Tapeatria but are operated by third parties.

Consequences: One of the consequences of too much implementation effort and cost can be that the intermediary becomes very dependent on the rapid generation of revenue. Tapeatria shows this can be risky for a new intermediary without a customer base. Voogd & Voogd benefited from their traditional position as an intermediary.

Pattern 2: Working cross suppliers for customers

Problem: An intermediary can choose between much working across suppliers for customers with greater opportunities to add value for customers or little working across suppliers for customers with greater opportunities for suppliers to establish and maintain relationships with customers.

Solution: An intermediary should offer as much cross-supplier functionality and uniformity as possible where acceptance by customers is the main concern. Tapeatria and Voogd & Voogd make it easier for customers to work with more suppliers, compare different products and/or suppliers, and switch between suppliers. Voogd & Voogd offers customers one form for obtaining quotes from multiple insurance companies, while Meetingpoint's customers have to submit a separate form for each individual

company. If acceptance by suppliers is the primary concern, an intermediary should offer less cross-supplier functionality. Through Meetingpoint, customers select a supplier first and then a product, while through Voogd & Voogd they begin by selecting a product and obtain an overview of suppliers later. Meetingpoint's suppliers determine the extent to which electronic processing of a quote or application occurs, while for Voogd & Voogd this is the same for each product. An intermediary may try to combine these approaches by offering as much cross-functionality and uniformity for non-competitive elements and as little cross-functionality and uniformity for competitive elements. This is to some extent the case with Meetingpoint, which creates uniformity for administrative forms without product harmonization. Meetingpoint also offers the same services for all suppliers but leaves the selection of products and functions and the administrative processing to the suppliers.

Consequences: Working across suppliers and uniformity makes an intermediary attractive for customers who want to work with multiple suppliers. This can be particularly important for strengthening an intermediary's position in the business network and competing with direct business between customers and suppliers, as is the case with Voogd & Voogd. If the intermediary is more a service provider for suppliers, the choice of less cross-working makes it more attractive to suppliers, as is the case with Meetingpoint. In this case, the intermediary can serve the suppliers' customers and obtain its revenue from suppliers.

Pattern 3: Supply chain structure

Problem: An intermediary can choose between a centralized supply chain with lower involvement and integration for intermediary and suppliers or a distributed supply chain with higher involvement and integration for intermediary and suppliers.

Solution: An intermediary should opt for a centralized supply chain if it wishes to have full control over business processes and limited business integration. But the intermediary then also bears all effort and cost of the operational activities. Voogd & Voogd takes care of the processing of insurance applications themselves while Meetingpoint leaves it to the insurance companies. With a centralized structure suppliers are relatively unaffected by the intermediary. The introduction of an electronic marketplace by Voogd & Voogd required no changes for the insurance companies. An intermediary should choose a distributed structure if it cannot bear the operational effort and cost of performing all operational activities themselves or if it wishes to leverage the capabilities and resources of its suppliers. A distributed structure is also required if suppliers wish to have control over some of the activities or resources. Tapestry's drop-ship suppliers did not want their fabrics on consignment at the Tapestry's warehouse. A distributed structure requires the integration of business processes and ICT systems of the intermediary and suppliers. It also means suppliers have to be willing and able to perform the operation and integration activities. The Tapestry's drop-ship suppliers are involved in Tapestry's order fulfillment process and have to cut the ordered pieces of fabrics from the rolls. Follow a hybrid strategy is a way to go beyond the involvement and integration trade-off. The intermediary can use a centralized structure for some suppliers and a distributed structure for others. Tapestry offers both on-consignment and drop-ship logistics to suppliers. Another strategy is to standardize the cooperation with suppliers or lower the integration requirements. Tapestry cooperates with all drop-ship suppliers in the same way. SeaQuipment has a simple integration with maritime sellers via web forms and deeplinks.

Consequences: With a centralized structure, the intermediary should be aware of an increase in role size (see also the 'role size' pattern). Moreover, suppliers may not wish to cooperate in a centralized manner. Tapestry's larger fabric producers did not want to place their fabric rolls on consignment and Voogd & Voogd's insurance companies may become less willing to cooperate via an authorized brokerage relationship because of the risks and cost considerations. With a distributed structure, the intermediary is more dependent upon suppliers. The intermediary and suppliers need to agree on the details of their cooperation arrangement and the supplier service level. The intermediary may also want to select suppliers according to their capabilities and resources and to check suppliers regularly in order to guarantee the quality of customer service.

Pattern 4: Supply transparency for customers

Problem: An intermediary can choose between much transparency about suppliers and the supply of products with greater opportunities to create value for customers or little transparency about suppliers and the supply of products with greater opportunities to capture value for intermediary and/or suppliers.

Solution: If acceptance by customers is the chief concern, an intermediary should create as much supply transparency as possible for customers. Voogd & Voogd makes it easy to gather information on and compare of insurance products of different suppliers. If acceptance by suppliers or its own interests are the main concern, an intermediary should create as little supply transparency as possible for customers. Meetingpoint does not support the comparison of insurance products. Tapestry's interior designers cannot approach fabric producers directly because they are unknown to them. A way to go beyond the customer-supplier value trade-off is to emphasize the positive effects for the industry or distribution channel. Voogd & Voogd makes the agent channel more competitive vice versa the direct channel. A way to limit possible disadvantages for suppliers is provide more supply transparency to a targeted group of customers and less to other users. Only interior designers with a trade account can get price information from Tapestry.

Consequences: One of the consequences of creating supply transparency is that the intermediary has to pay more attention to offering products that are representative for the market they operate in. Voogd & Voogd wants to provide attractive policies and the main insurance companies.

Pattern 5: Demand transparency for suppliers

Problem: An intermediary can choose between much transparency about customers and demand for products with greater opportunities to create value for suppliers or little transparency about customers and demand for products with greater opportunities to capture value for intermediary and/or customers.

Solution: If acceptance by customers is the primary concern, an intermediary should create as little demand transparency as possible for suppliers. For example, maritime buyers can anonymously check which sellers offer a particular maritime product. This also makes the catalogue very easy to use because users do not have to register and sign in. An intermediary can also limit demand transparency to protect their own position. The fabric producers of Tapestry cannot approach interior designers directly because they are unknown to them. If acceptance by suppliers is the principal concern, an intermediary should create as much demand transparency as possible for suppliers. The maritime sellers of SeaQuipment wanted to know more about the users and usage of SeaQuipment to assess the impact of their marketing. Tapestry considered selling market information about product trends to fabric producers. An intermediary can go beyond this customer-supplier value trade-off when the intermediary or suppliers create value for customers in return for more demand transparency. Voogd & Voogd support insurance agents with portfolio analysis.

Consequences: Demand transparency can increase the intermediary's chances of differentiating itself from direct business between customers and suppliers, for example, by providing market information. But it can also harm the intermediary's position by revealing supply information. This was one of Tapestry's main concerns. The intermediary should show restraint with respect to demand transparency because of privacy concerns and possible damage to its reputation, even if it is possible to give customers something in return.

Pattern 6: Customer service innovation

Problem: An intermediary can choose between introducing an electronic service with as many new service elements in its customer (self-)service with greater opportunities for relative advantage (innovation and efficiency) or as many traditional service elements in its customer (self-)service with greater opportunities for compatibility.

Solution: For more relative advantage an intermediary should choose for a customer (self-)service with as many new (electronic) service elements as possible. Initially Tapestry offered an online catalogue instead of a paper catalogue because it is cheaper and more up-to-date. However, for more compatibility an intermediary should choose for a customer (self-)service with as many traditional service elements as possible. Later Tapestry also offered a paper catalogue to interior designers. An intermediary should select a mix of new and traditional elements offering enough relative advantage, while the compatibility does not hamper acceptance. Insurance agents can make use of Meetingpoint via the familiar extranet of insurance companies or via the new Meetingpoint portal. Sometimes it may be possible to introduce a new electronic service that offers both a relative advantage and compatibility. Meetingpoint also connects to the traditional administrative software of insurance agents. An intermediary may not be willing or able to offer traditional service elements to customers. Voogd & Voogd selects insurance agents that want to work electronically and have a high level of automation.

Consequences: The intermediary should bear in mind that the less traditional the elements it offers, the slower the acceptance of the new, electronic service. When selecting customers, the intermediary should be aware that the target group of users is much smaller. The intermediary has to determine selection criteria that balance quality and quantity. A smaller user group can be problematic if the intermediary has to invest substantial effort and cost (see also the 'role size' pattern).

6 THEORETICAL DISCUSSION

There is a growing body of knowledge on the (new) roles of electronic intermediaries (for example, Anderson & Anderson, 2002; Bailey & Bakos, 1997; Kambil & van Heck, 2002). In general, this literature takes as explicit starting-point or implicit assumption that an intermediary should fulfill a role as extensive as possible and that this is beneficial for the intermediary. On the one hand, the 'role size' pattern follows a similar logic for value creation by the intermediary. This is in line with Porter's value chain (Porter & Millar, 1985) the value configuration approach (Stabell & Fjeldstad, 1998). In a value configuration, value can be created by means of value activities and the linkages between these activities. Therefore, the more value activities an intermediary covers in the exchange between customers and suppliers, the more possibilities the intermediary has for creating value. On the other hand, the 'role size' pattern also emphasizes the drawbacks of an extensive role for the electronic intermediary: the more extensive the role, the higher the implementation effort and cost.

Kambil and van Heck (2002) warn that for auctions the devil is in the detail. This also applies to intermediaries in general. The 'working cross suppliers' and 'supply chain structure' patterns illustrate that high-level form and role choices (for example, a managed marketplace) may still result in different kind of services and processes for customers and suppliers (for example, on consignment and dropship logistics). High-level form and role choices can cause misunderstanding about what exchange services an intermediary is actually offering to customers and suppliers and what the effects are on the interests of customers, intermediary, and suppliers. Although, Meetingpoint and Voogd & Voogd initially seem very similar, they differ substantially in their services for customers and suppliers.

The 'role size' and 'supply chain structure' patterns can be viewed as an insourcing or outsourcing decision if the transfer of a significant amount of operations and control is involved. Singh (2000) refers to intermediation as a special case of outsourcing to specialists. Outsourcing is a business decision to have activities inside or outside a firm because of opportunities for saving resources (service level versus costs) or acquiring capabilities, allowing a firm to focus on core competencies (Smith, Mitra, & Narasimhan, 1998). Both intermediary and suppliers can be viewed as outsourcing client and provider. Electronic intermediaries can insource and suppliers can outsource (a part of) marketing & sales, logistics, or ICT. Voogd & Voogd, rather insurance companies, takes care of quotes and approvals for insurance policies. Intermediaries can also outsource, and suppliers insource, (a part of) marketing & sales, logistics, and ICT. Meetingpoint leaves quotes and approvals for insurance policies to the insurance companies.

The 'supply transparency' and 'demand transparency' patterns relate to customers' and suppliers' opportunities for leveraging information, and the function of the intermediary. Asymmetries in small amounts of critical information often determine which players will win and which will lose (Kambil & van Heck, 2002). The visibility of information is a key issue in electronic markets as shown, for example, by Kambil and van Heck's (2002) particular attention for product presentation. Sharing of information is also an important issue in supply chain management in relation to competitive advantage and business value (Dai & Kauffman, 2002a). Transparency is not a given for the intermediary; it is a strategic choice (see also, for example, Soh, Markus, & Goh, 2006). On the one hand, intermediaries can undermine the possibilities of leveraging information by reducing information asymmetry while, on the other hand, intermediaries can create new opportunities via information asymmetry because of their position and the capabilities of ICT.

The 'supply transparency' and 'demand transparency' patterns emphasize that the strategic use of transparency requires well-considered design choices and insight into the variations in which they can be implemented (Soh et al., 2006). These patterns discuss specific options for transparency towards customers and suppliers. In general, the expectation is that intermediaries are needed less for facilitating supply transparency because electronic business makes it easier for customers to collect information directly from suppliers (Anderson & Anderson, 2002). However, the 'supply transparency' pattern emphasizes the fact that an intermediary can still add value for customers by means of, for instance, single application forms (for example, Voogd & Voogd) and uniform product structures and descriptions (for example, Tapestry).

The trade-off between customer and supplier interests for supply transparency is well-known. Price transparency is often quoted as a reason for failure of intermediaries (for example, Wise & Morrison, 2000). However, the 'supply transparency' pattern points out ways of going beyond this trade-off. Price transparency can be implemented in different ways, for example, only for trade members or without revealing the supplier, as Tapestry did. Price transparency can also improve the competitiveness of a distribution channel over other channels, which is particularly relevant to suppliers bound to a particular channel, as is the case with Voogd & Voogd and its insurance companies.

The 'customer service innovation' pattern is based on the 'relative advantage' and 'compatibility' characteristics of innovations of Rogers (1995). According to Rogers, both relative advantage and compatibility should be increased to increase acceptance. This pattern adds to Rogers the trade-off between relative advantage and compatibility for exchange design. This pattern is in keeping with Kambil and van Heck (2002), who argue that electronic markets should be better than what now exists but should also fit existing processes. Dai & Kauffman (2002b) refer to the possibilities of business-to-business intermediaries for business process innovation and the need for technological compatibility.

The 'customer service innovation' pattern relates to the research of Day, Fein, and Ruppertsberger (2003), who distinguish between breakthrough and reformed markets opportunities for technology. While breakthrough applications create new offerings that would not have been possible without the new technology, reformed applications are characterized by a low ability to capture value from Internet technology. Their research suggests that selectively introducing new elements in existing business models is most often the right option for B2B exchanges. This corresponds to Voogd & Voogd, a traditional intermediary introducing an electronic service, and to Tapestry, a new intermediary introducing traditional service elements after an initial focus on new elements. Electronic intermediaries introducing new service elements can also concentrate exclusively on those industry segments where an Internet model offer real advantages, even if it is only a modest proportion of the overall industry (Porter, 2001). However, the relationship with the 'role size' pattern is important here. The intermediary should be aware of its role size because a more extensive role comes with greater effort and cost, which may not suit a smaller industry segment, as may have been the problem for Tapestry.

Another perspective on combining electronic business with the traditional way of working is provided by the 'supply chain structure' pattern, which discusses the option of using traditional co-operation models for suppliers. This pattern shows how innovation of the customer service can be combined

with compatibility for suppliers, with the intermediary as the adapter between them. However, while the ‘customer service innovation’ and ‘supply chain structure’ patterns suggest that electronic intermediaries may need to integrate traditional service elements in their customer service or cooperation with suppliers, this does not mean that electronic intermediaries should stay or become a traditional intermediary. Electronic intermediaries can create strategies that involve new, hybrid models (Porter, 2001; Steinfield, 2002). Meetingpoint introduces new electronic services that are compatible with agents’ existing way of working by means of an ICT coupling with their administrative software.

7 CONCLUDING REMARKS

We identified and discussed six exchange design patterns for electronic intermediaries. These patterns provide guidance in exchange design for practitioners and contribute to the development of design theory for researchers. The patterns were derived from the analysis of four different cases, based upon a common design model. For a more in-depth foundation of the research and discussion of the exchange design model and patterns we refer to Fiel (Fiel, 2006). The concept of patterns has not yet been used in this type of design. Most of the work, after the initial work by Alexander et al. (1977), has been in software development, where it is applied at a much more detailed level than in this paper.

The patterns identified seem to be an interesting contribution to design theory and a starting point for the design of electronic intermediaries, despite the fact that the current set of patterns is limited in scope and have not been proven universally applicable yet. More research is required to complete these patterns with additional patterns and other design theory for electronic intermediaries. Besides, next to customers, intermediary, and suppliers there are also other stakeholders that can be taken into account. For example, for Meetingpoint also the ICT firms that provide the administrative software of insurance agents are important stakeholders. Moreover, to support the exchange design process the exchange design model and patterns should be embedded in a design approach. For example, a step-wise refinement by relating exchange design to the more generic design of business models and networks and the more specific design of particular kinds of intermediaries and components such as the market mechanism. Currently, however, there is little consensus on an appropriate design approach for e-business, covering the step from basic business models (Timmers, 1998; Osterwalder, 2004) to detailed design (Janssen & Steen, 2001).

The trade-offs identified for the design patterns confirmed the starting-point of our research: exchange design is problematic due to the many design options and the interests of multiple actors that need to be taken into account. Drawing attention to the trade-offs can support an intermediary in designing balanced exchanges with a positive net effect for all actors and prevent unexpected side-effects, such as the fact that SeaQuipment’s maritime sellers had little information about maritime buyers because of its openness. However, what is not addressed in this paper is how to combine the different patterns to come to a balanced exchange design. For this more research is needed on how the exchange design choices and the actors’ interests interact and how the actors evaluate the electronic service and its impact upon their business.

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ANNEX A: LIST OF CASE FINDINGS AND PATTERNS

		<i>P1. Role size of intermediary</i>	<i>P2. Working cross suppliers</i>	<i>P3. Supply chain structure</i>	<i>P4. Supply transparency</i>	<i>P5. Demand transparency</i>	<i>P6. Customer service innovation</i>
<i>Tapestria</i>	TP1. Different kinds of (electronic) services for customers and suppliers [R,N]						
	TP2. Complete, advanced service (to customers), including logistics [R,N]	X	X	X			
	TP3. Managed marketplace and logistics require effort and cost [R]	X					
	TP4. Outsourcing can make managed marketplace and logistics feasible [R]	X		X			
	TP5. Standardization prevents Tapestria getting too large and complex [L]			X			
	TP6. Tapestria creates non-transparency about customers and suppliers [T]				X	X	
	TP7. Combining new and traditional elements [N]						X
<i>SeaQuipment</i>	SQ1. Limited role, transparency and novelty suitable but little value [R,T,N]	X	X		X		X
	SQ2. Specialized information provider, no move to transaction model [R,T,N]	X			X		
	SQ3. Openness benefits customers, harms intermediary and suppliers [L,T]					X	
	SQ4. A product structure matters and can add value [R,T]		X		X		
	SQ5. Selection of sellers has to balance quantity and quality [L]						X
<i>Meetingpoint</i>	MP1. Customers need motivation and ability to optimally benefit [R,N]						X
	MP2. Platform with options provides customers and suppliers flexibility [R,N]		X				X
	MP3. Portal requires working cross suppliers for customers [R,L,T]		X		X		
	MP4. Limited role is possible because of complementary services [R]	X					
	MP5. Industry standards both opportunity and threat for intermediary [L]		X	X			
	MP6. Limited transparency for customers and suppliers as hygiene factor [T]					X	
	MP7. Building on existing customer-supplier relationships [L,N]						X
	MP8. Cooperation between suppliers possible but difficult						
<i>Voogd & Voogd</i>	VV1. Extensive role provides opportunities to add value for customers [R,T,N]	X	X		X		X
	VV2. Supply chain integration can be a threat to the intermediary [R]			X			
	VV3. Preparatory investment of intermediary in processes and ICT [R]	X					
	VV4. Selection of customers by intermediary [L,N]						X
	VV5. Intermediary leverages traditional arrangement with suppliers [R,L,T,N]	X		X		X	
	VV6. Have customers share in the benefits for the intermediary						
	VV7. Intermediary cooperates and competes with suppliers						

Note: R,L,T, and N refer to the exchange design themes Role, Linkage, Transparency, and Novelty.